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## Borbála Nature Trail – Recovery potential for abandoned mining and industrial areas based on a planned nature trail

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### Abstract

Learning means a lot more than meeting the school curriculum. Only a small part of it can be done in classrooms, it includes lots of additional activities outside of school. Present-day Hungarian public education is traditionally knowledge-driven. Learning normally does not include field activities, even though these extracurricular field activities are the ones giving the pupils a chance to observe the natural phenomena in their natural place and to understand what they learned through their experiences. In some areas that are particularly important in today's educational system, like environmentally conscious education or sustainability education, the field activities would be especially important. They are also needed to understand the connections, the problems and the possible solutions between nature and society. For this purpose institutions and devices that are able to aid the learning process are needed. Borbála nature trail that we designed presents the industrial history of the once thriving industrial city, Salgótarján and it is a perfect place for field activities. The theme of the nature trail can be inserted into the curriculum at several places, including environmentally conscious education at the topic of man-made environment and it can also be found among the topics of sustainability education.

*Keywords:* Salgótarján, nature trail, industrial history, interactive booklet

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### 1. Introduction

In the Hungarian public education field activities can rarely be found, lexical knowledge is in the focus. The teachers are too focused on the curriculum and that puts unnecessary pressure on the students. This so-called upward-looking pedagogy does not take into account the characteristics of certain age groups and is classroom-based (Makádi 2015). But learning is so much more than what can be included in a lesson (Vásárhelyi 2010). The extracurricular activities out of the classroom provide the students the chance to observe phenomena and natural processes in their natural place and evaluate their experiences (McPherson et al 2014, Makádi 2015). On certain topics like environmental consciousness and sustainability, out-of-school activities are particularly important (Johnson 2014). For example, the point of environmental consciousness is to make the students develop a sense of individual responsibility towards the

environment (natural and man-made) and that is impracticable solely in school (Schróth 2004). And for this exact reason environmentally conscious education is like a catalyst for field activities in schools. The National Curriculum and the curriculums of the science subjects both provide the opportunity for out-of-school activities, but in many cases it still doesn't happen (110/2012. (VI. 4.) Government Regulation, 51/2012. (XII. 21.) EMMI Regulation). The amount of field activities in a school depends solely on the principal and the teachers. The institutions often support knowledge-driven education because of the traditions and the expectations of the parents (Siegmar 2017). Other significant problems are the overloaded teachers and the lack of time and money (Vásárhelyi 2010, McPherson et al 2014).

The nature trails are the essential, well-known showrooms of education. It connects the visitors and nature, it shows the phenomena and natural processes in their real spot (Kollárics 2015). Their goals are for example the independent gaining of knowledge, developing the visitors environmental awareness, demonstration of new aspects, information-based cognition, showcasing a specific area. Typically the knowledge can be gained at the stations, it is systematic, special guidance is not needed so the visit is independent (Kiss 2007). Thereby the trails are suitable for both school trips and family trips and are especially important in environmentally conscious and sustainability education (Sever et al 2018).

Since the 2000s more and more nature trails are established in Hungary. It is not easy to determine the concrete number of them, because not only organizations but individuals are able to create them and new ones are constantly opening. The nature trails of Hungary on average are 4.1 km, they have 10 stations and it takes 1-3 hours to complete them (Kiss 2007). Based on two databases: Data Base of The National Parks Directorate and tanosveny.info most of the Hungarian nature trails showcase natural assets and not the man-made environment, and based on these two databases there is no nature trail in Hungary that is industrial history-themed (Fig.1.).

On the Fig. 1., we visualized the themes of the Hungarian nature trails by counties. The trails called special are the ones that are individual in the country or there are only a few of them, for example architectural, ethnographic and religious-themed trails.

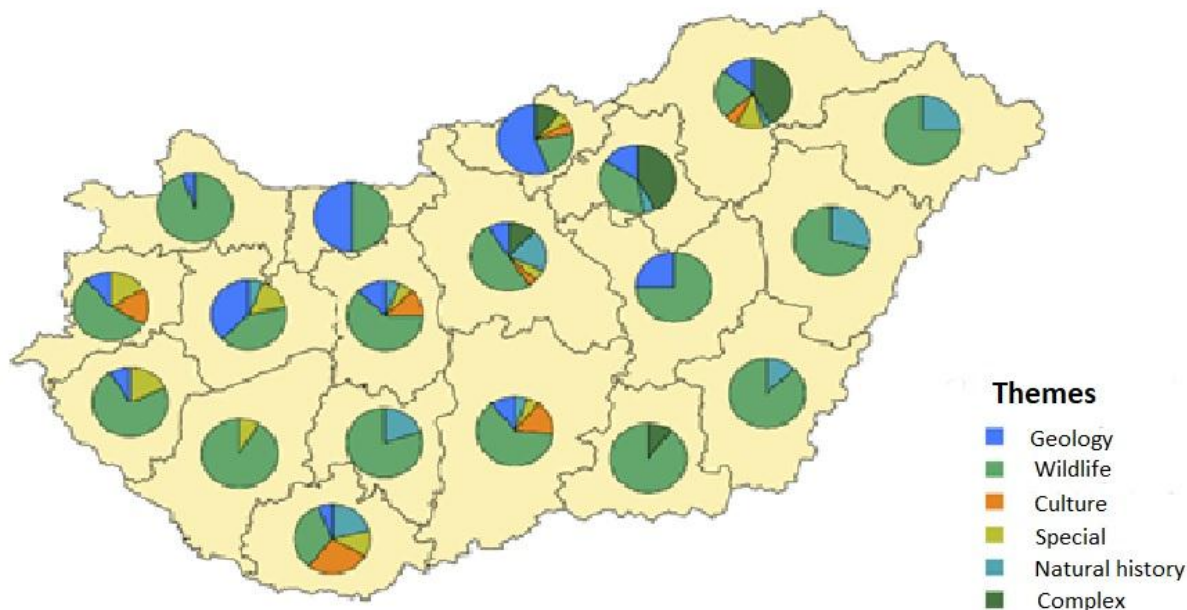


Fig.1. Themes of Hungary's nature trails (sources: tanosvenyek.info)

The nature trail that we designed would be unique in the country and with that, it could help the environmentally conscious and sustainability education. The themes to be presented can be found in these educational areas, they display complex social-economic relations. It connects the natural environment with society, it connects the visitor with their environment. Among its themes, power generation and mining are ones that can help with the understanding of the need to change resources for energy production. It shows the impact of nature on society and society's impact on nature. It showcases how we use and use-up our natural resources through the regional change of usage of brown coal. Understanding this helps us understand the need for changes. The showcased themes can be found in the curriculum of several school subjects: geography, nature studies, chemistry, physics, and history. Ergo it can be inserted into the curriculum at several places. The teachers can use it to raise the student's attention on a topic by showing it to them in the everyday world. It can be useful as a repeating or summarizing class because it presents the connections in the knowledge. It is a ready-made knowledge so it requires less preparation from the teacher. The nature trails provide interesting facts and new information for all age groups.

## 2. Presentation of the area to be processed

The nature trail is based in Salgótarján and in its surroundings. The town originally was an agricultural settlement, it became a city in the 19th century when the brown coal was found (Gajzágó 1962). The first tunnel, the Ó-Mária-tunnel was opened in 1848. They started the

exploitation of the good quality 2-2,5 m thick coal seam here (Sebestyén & Szvircsek 1992). In 1867 the Hungarian National Railway came to Salgótarján allowing it to become the provider of brown coal for the industry of the capital city (Szvircsek 2000). The founding of Salgótarjáni Kőszénbánya Ltd. in 1868 was the beginning of large-scale mining, leading to the industrialization of the county. They provided 32% of the coal extraction of the country at the turn of the century and in the 1900s the steel-making was the 1/3 of the national production (Szvircsek 2000). The power structure change of 1956 caused regression. Mining lost its leading role in the area (Sebestyén & Szvircsek 1992). After the change of regime they closed the mines, the industry degraded because of the unfavorable natural conditions and because of the termination of state subsidies. The unemployment rate and migration increased. The former industrial buildings, the cinder cones and all the other remains of the once thriving industry can still be found there.

### 3. Results

Borbála nature trail would showcase Salgótarján's industrial history. It will include mining, transportation, the power generation, the manufacturing, and the generated waste. And the connection between these and the geological condition of the area and their social aspects. The goal is to be interesting for all age groups, for tourists, students, and locals. There are 2 years for the planning and we are halfway through with it.

When we planned the route, we consulted a geologist who knew the site well. Several field walks were also made together with him. He shared a lot of interesting information with us and he has shown us places that are closely related to the subject. Based on these, we have marked the route on the map.

The Borbála nature trail includes the industrial history of the city. It was named after the patron saint of miners, Saint Borbála (Saint Barbara in English speaking area). The local miners believed that the saint would protect them at the dangerous work (Szvircsek 2000). The sign of the nature trail (Fig.2.), which includes the silhouette of the steel factory and a tram that symbolizes the mining, will be painted on the full length of the trail.

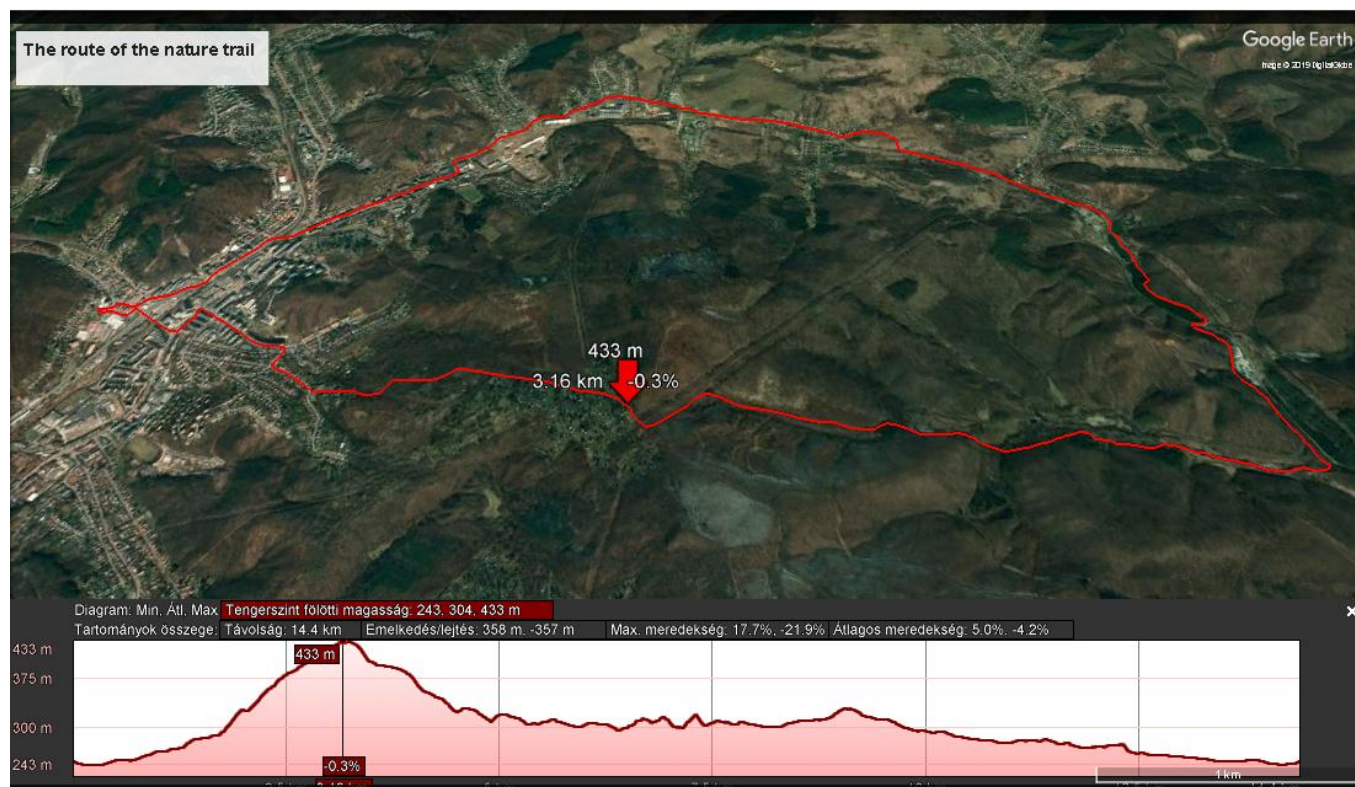


Fig. 2. The sign of the nature trail

The route measured on a field survey (Fig.3.) makes a full circle. It's starting and ending point is the Mining Museum in Salgótarján. We took into account that the trail is for all age-groups so there are no significant height differences (Fig.3.).

During the field survey, we determined where the stations will be and what we want to showcase at certain stations. They include all the information that can be interesting for the visitors on the topic (1st chart). The route has a natural flow both in reality and in the topics. It starts with mining and through energy production, it ends with industry. In closing, it presents the life of miners and industrial workers.

The whole route is 17km with 27 stations and it can be completed in 6-7 hours. To make the trail available for all age-groups the only significant height difference, Pécskő (542 m) will not be part of the trail but will be an alternative for the interested. The visitor can read about the curiosities of the place at Novohrad-Nógrád Geopark on an information board. The goal of the



station called View (6th) at the beginning of the trail is that in good weather the visitors can see the whole city from here. On the starting board, there will be a well usable map (Fig.3.) with the whole route, the stations and the relief of the area.

Fig.3.: The route of the nature trail and the terrain profile of the nature trail



We previously mentioned that the nature trails in Hungary are 4 km on average with 10 stations. The longer ones can be done with bicycles or cars instead of walking (Kiss 2007). So Borbála nature trail as a walking route is really long. We want it to be available for all age-groups so we divided the trail into 3 big parts: mining, energy production and industry (Fig3 and Fig.4.). Transportation can be found in all of them. This way the visitors can decide which topic is the most interesting for them if they don't want to complete the whole trail or if they don't have enough time. At the connecting points, there are bus stations and parking places. The stations are interesting and understandable separately too. The visitors are informed about the 3 sections, their goal, and theme at the starting point. Every section has its own color, which helps with orientation. The information boards and the signs are both this color and the color is displayed on the maps too (Fig.3. and Fig.4.).

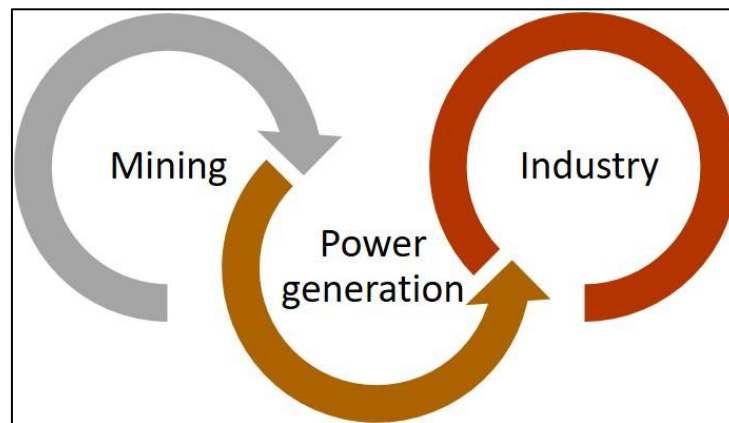


Fig.4. Thematic units of the nature trail

The trail will have informational booklets. Their goal is to be informational and interesting just like the boards. There are different kinds and for the Borbála nature trail, we want to guide booklets that have little tasks and games that can be completed during the hike. They also have additional information and explanations for children (Kiss 2007). These booklets are normally A5 size, their length varies. They can be found at the trail or in the area or on the internet. If the booklets are on the internet normally you can use QR codes to find the right ones for the station.

The main goal of Borbála nature trail is to be a good experience for all age groups, particularly for children. It is important to draw and keep the attention of children. The booklets provide different tasks for different ages especially for children in elementary school. Industrial history is a topic that is basically not interesting in itself for children. The smaller ones don't even understand it, the older ones' attention can't be kept with the written form of it. But if instead of textbooks we use pictures, illustrations and tasks on a field trip its easier for them to find parts

that are interesting for them. For example the children have to queue the production process from mining to power plant use or the children can see the degradation of the landscape by the dumps on “before and after pictures”. And it also helps them connect the things they study to their everyday life.

On the first few pages of the booklet, there will be basic information about the nature trail with a map and pictures. After that will be the rules. There could even be a task about them. The remaining part of the booklet is additional information, explanations, pictures, tasks and games for each station. Some games will be in the booklets, but some of them could be played at the stations.

The booklet should be available for visitors at all times. It would be ideal if the visitors could get it somewhere near the starting point for example in the Mining Museum. Besides we want to make it available online, so families can download it at home. Another solution would be using QR codes at the stations, so people can easily connect to them on their phones even if they come across the trail when hiking in the area.

#### **4. Conclusion**

The Borbála nature trail will be an interactive, walking route presenting the industrial history of Salgótarján. We already planned the route of the nature trail and the place of the stations. We have the information that will be presented. The starting board, the maps, the pictures and the first pages of the interactive booklet are ready. We still have to design the remaining boards, finalize the information that will be presented at the stations, finalize the route and finish the booklet. The nature trail has a website which will be available for the public after all necessary information has been uploaded. We plan to go to the route with the children of different ages and based on this we will modify and improve the tasks.

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#### **References**

- Gajzágó A. (1962): A salgótarjáni iparvidék. Nógrád Megyei Munkásmozgalmi Múzeum. Salgótarján. pp. 8-20, 27-34
- Johnson, B.B. (2014): How perceived gains and losses from nature trails affect trail management preferences. *Journal of Environmental Psychology*. Volume(40) pp. 430-439.
- Kiss G. (ed.) (2007): Tanösvények tervezése, módszertani útmutató. Bükk Nemzeti Park Igazgatósága. Eger. pp. 7-69

- Kollarics T. (2015): A tanösvények szerepe a környezeti szemléletformálásban- Tervezés, hatékonysági vizsgálat és módszertani változások. Doktori (PhD) Értekezés, Nyugat-Magyarországi Egyetem Erdőmérnöki Kar, Kitaibel Pál Környezettudományi Doktori Iskola, Környezetpedagógiai program. Szeged. p. 33-45, 69-74
- Makádi M. (2015): A természetismeret tanítása és tanulása. Eötvös Loránd Tudományegyetem, Természettudományi Kar. Budapest. pp. 254-265, 339-370.
- McPherson, F.C., Mayer, S.F. (2014): The importance of connection to nature in assessing environmental education programs. *Studies in Educational Evaluation*. Volume(41) pp. 85-89.
- Schróth Á. (2004): Környezeti nevelés az iskolákban. Trefort Kiadó. Budapest. pp.16-20
- Sebestyén K., Szvircsek F. (1997): Salgótarjáni új almanach. Nógrádi Történeti Múzeum Baráti Köre. Salgótarján. pp. 6-10, 29-31, 88-141, 172-174.
- Sever, I., Verbic, M., Marusic, Z. (2018): Measuring trail users' perception of crowding in a peri-urban nature park: A best-worst scaling experiment. *Urban Forestry & Urban Greening*. Volume(35) pp. 202-210.
- Siegmar, O., Pensini P. (2017): Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behavior. *Global Environmental Change*. Volume(47) pp. 88-94.
- Szvircsek F. 2000: Bányáskönyv. Magyar Millennium. Salgótarján. pp. 49-104.
- Vásárhelyi J. (ed.) (2010): Nemzeti Környezeti Nevelési Stratégia. Magyar Környezeti Nevelési Egyesület. Budapest, pp. 43-60, 93-96, 218- 223, 239-293.
- Vertich J. (1990): Volt egyszer egy fogaskerekű. Nógrádi Történeti Múzeum Baráti Köre. Salgótarján. pp. 13-35.
- 110/2012. (VI. 4.) Korm.rendelet A Nemzeti alaptanterv kiadásáról, bevezetéséről és alkalmazásáról [http://ofi.hu/sites/default/files/attachments/mk\\_nat\\_20121.pdf](http://ofi.hu/sites/default/files/attachments/mk_nat_20121.pdf) (last download: 4<sup>th</sup> March 2019)
- 51/2012. (XII. 21.) számú EMMI rendelet a kerettantervek kiadásának és jóváhagyásának rendjéről <http://kerettanterv.ofi.hu/> (last download: 4<sup>th</sup> March 2019)

### Short professional biography

Dr. Zsuzsanna Angyal is an assistant lecture in the Eötvös Lorand University, Faculty of Science. She teaches several course in the Centre of Environmental Science (Environmental protection, Nature protection, Soil science, Teaching methodology, field trips) and she organizes three education projects. She graduated from Eötvös Loránd University as a Geography and Science teacher. In 2009 she graduated with a doctorate. She's research fields are teaching methodology in the environmental education.

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